BATHYTHERMOGRAPH LOG

Prepared by

COMMANDER, NAVAL METEOROLOGY AND OCEANOGRAPHY COMMAND
in accordance with specifications established by the
WORLD METEOROLOGICAL ORGANIZATION (WMO)

CNMOC 3167/2(Rev 3/00)

INSTRUCTIONS FOR PREPARING THE BATHYTHERMOGRAPH LOG SHEET

INTRODUCTION

The Bathythermograph (BT) is the principal instrument used by United States ships and aircraft to record seawater temperature variations with depth. The BATHYTHERMOGRAPH LOG SHEET is designed for use with the BT and provides: (1) a message format for radio transmission of the BT data for use in oceanographic forecasting and (2) a data format for BT analog and digital processing at the Naval Oceanographic Office. The radio message format supersedes all other formats previously used for shipboard or aircraft BT Message reporting.

The instructions describe:

1. **How to mark the BT recorder chart after the observation is taken;**
2. **Where to mail log sheets and BT recorder charts;**
3. **How to obtain additional log sheets;**
4. **The procedure for filling in the "REFERENCE INFORMATION" "OPTIONAL ENVIRONMENTAL INFORMATION" and "RADIO MESSAGE INFORMATION" portions of the log sheet;**
5. **How to interpret the temperature-depth trace;**
6. **How to address radio messages; and**
7. **Special Instructions for Navy use.**

Latest editions of the following also provide amplifying information:

1. **Fleet Oceanographic and Acoustic Reference Manual (RP33)**
2. **COMSCINST 3121.9**
3. **CNMOC 3140.1**
4. **METOC 60-1T-0001**

HOW TO MARK THE BT RECORDER CHART

Enter on the face of each BT recorder chart the information listed below in the same sequence. NOTE: Do not obscure the temperature trace.

Ship #
Cruise #
Latitude (N or S)
Longitude (E or W)
Time (UTC)
Day / Month / Year
Observation #
Bottom Depth

WHERE TO MAIL BATHYTHERMOGRAPH RECORDER CHARTS

Mail CLASSIFIED and UNCLASSIFIED BT recorder charts to:

Commanding Officer
Naval Oceanographic Office
1002 Balch Blvd., Code N34D
Stennis Space Center, MS 39522-5001

Note: BT Log sheets are not required to be sent to the Naval Oceanographic Office. Retain onboard for own records.

HOW TO OBTAIN ADDITIONAL BATHYTHERMOGRAPH LOG SHEETS

Additional BT log sheets may be downloaded through your regional METOC Center Web site or by contacting your regional METOC fleet liaison representative.

COMPLETING THE BATHYTHERMOGRAPH LOG SHEET

Follow SAMPLE BATHYTHERMOGRAPH LOG (see below) as guide for recording data

I. REFERENCE INFORMATION

A. On each Bathythermograph Log sheet, record the following information:

1. **PLATFORM TYPE (from Table 1)**
2. **PLATFORM NAME (when observations are from aircraft, enter squadron designator)**
3. **PLATFORM DESIGNATOR (Hull Number)**
4. **COUNTRY**
5. **INSTITUTION (or sponsoring activity)**
6. **PROJECT (name of operation)**
7. **CRUISE NUMBER (or project number, when applicable)**

Table 1
PLATFORM TYPE CODE

1. Ship	5. Submersible / Submarine
2. Lightship	6. Aircraft
3. Buoy	7. Ice Island
4. Fixed Tower	8. Fixed Coastal Station

B. For each individual bathythermograph (BATHY) observation, the following information is also recorded:

1. **STATION NUMBER (when applicable).**
2. **OBSERVATION NUMBER (consecutive number). This number should correspond to that entered on the BT charts. For ships and aircraft, numbers should be consecutive from number "1" for the first observation after leaving the port or airfield and ending with the last observation of the cruise or flight.**
3. **INSTRUMENT (Type, i.e., SXBT, AXBT, SSXBT). Temperature profiles taken with multiple measurement systems such as a CTD can also be encoded on this log sheet.**
4. **REMARKS. Enter any comments concerning the BATHY observation under this section. Such remarks might include the following: high seas, course change, improper wire unspooling, wire fouled on side of ship, and wire break.**

II. OPTIONAL ENVIRONMENTAL INFORMATION

Enter the following information as available:

1. **DEPTH TO BOTTOM (METERS) - Enter ocean bottom depth to the nearest meter.**
2. **WIND ($i_u$ddff)**
   - **i_u** **Wind speed units indicator - Enter "0" if wind speed in meters per second and "1" if speed in knots.**
   - **dd** **True wind direction (DIR) - Enter the true wind direction, in tens of degrees, from which the wind is blowing. Enter "00" for calm, "36" for a direction of 335 to 004 degrees, etc.**
   - **ff** **True wind speed (SPEED) - Enter true wind speed in meters per second or knots. Enter "00" for calm.**
3. **SEA LEVEL PRESSURE (PPPP) - Enter the corrected sea level barometric pressure to tenths of a millibar. Omit first digit for pressure values equal to or above 1000.0 millibars.**
4. **AIR TEMP - DRY BULB (S_nTTT)**
   - **S_n** **Air Temperature sign indicator - Enter "0" for positive temperatures and "1" for negative temperatures.**
   - **TTT** **Dry Bulb Temperature - Record the temperature to tenths of a degree Celsius.**
5. **AIR TEMP - WET BULB (S_nTTT)**
   - **S_n** **Air Temperature sign indicator - Enter "0" for positive temperatures and "1" for negative temperatures.**
   - **TTT** **Wet Bulb Temperature - Record the temperature to tenths of a degree Celsius.**
6. **SEA TEMP ($T_wT_wT_w$INSTR)**
   - **$T_wT_wT_w$** **Sea Surface Temperature - Record the temperature to tenths of a degree Celsius. [A thermometer which is read only to the nearest whole degree Celsius should be indicated in the tenths column by a solidus (/)]. To indicate negative temperatures, add 50.0 to the absolute value of the temperature and drop the negative sign. For example, -1.2 °C would be encoded as "51.2".**
   - **INSTR** **Instrument (from Table 2).**

Table 2
INSTRUMENT CODE FOR
SEA SURFACE TEMPERATURE

CODE	INSTRUMENT
1.	bucket thermometer
2.	thermometer in condenser intake on steam ships or inlet of engine cooling system on motor ships
3.	trailing thermistor
4.	hull contact sensor
5.	"through hull" sensor
6.	radiation thermometer
7.	bait tanks thermometer
9.	other

7. WAVE (P_W $P_W H_W H_W$)

P_W P_W Wave period (PER) - Enter the average wind wave period to the nearest second. Enter "00" for calm and "99" when the wind wave period cannot be determined because the sea is confused. When the wind wave period cannot be determined for any other reason, enter two solidi (//).

$H_W H_W$ Wave height (HT) - Enter the wave height using the half-meter code given Table 3.

Table 3
HEIGHTS OF WIND WAVES AND SWELL

Use "00" for calm. Use two solidi "// " when the height was not observed for any reason.

HALF-METERS CODE FIGURE	FEET	HALF-METERS CODE FIGURE	FEET	HALF-METERS CODE FIGURE	FEET
01	2	07	12	13	21
02	3	08	13	14	23
03	5	09	15	15	25
04	7	10	16	16	26
05	8	11	18	17	28
06	10	12	20	18	30

8. SWELL ($d_W d_W P_W H_W H_W$)

$d_W d_W$ Swell Direction (DIR) - Enter the direction from which the swell is coming in tens of degrees, using "01-36" for directions 010° to 360°, "00" for calm, and "99" for a confused sea with directions indeterminate.

P_W Swell Period (PER) - Enter the period of the swell in seconds using the code in Table 4.

$H_W H_W$ Swell Height (HT) - Enter the swell height using the half-meter code given in Table 3.

Table 4
PERIOD OF SWELL

Code Figure	Average Period In Seconds	Code Figure	Average Period In Seconds
5	5 or less	0	10
6	6	1	11
7	7	2	12
8	8	3	13
9	9	4	14 or more
		/	Calm or not determined

9. SOLAR RADIATION (LANG) - Enter the average value of the solar radiation in langleys per minute to the nearest hundredths. The average should be the hour preceding the synoptic hour, e.g.: 1100 - 1159.

10. PRECIPITATION (PRECIP) - Enter the amount of precipitation (RR) to the nearest 0.2 mm for the preceding six (6) hours.

11. WATER TRANSPARENCY (TRANS) - Enter the average value to the nearest meter.

III. RADIO MESSAGE INFORMATION

A. EVALUATING BATHY TRACE FOR RADIO MESSAGE INFORMATION ENTRIES. (See SAMPLE RECORDER TRACE below.) Navy and Coast Guard units may encode and transmit the BATHY trace in either English or metric units. All others must convert the BATHY from English to metric when temperature/depths are obtained in English units (use Tables 8 and 9). To facilitate the use of BATHY data for synoptic forecasting, the analysis procedures are as follows:

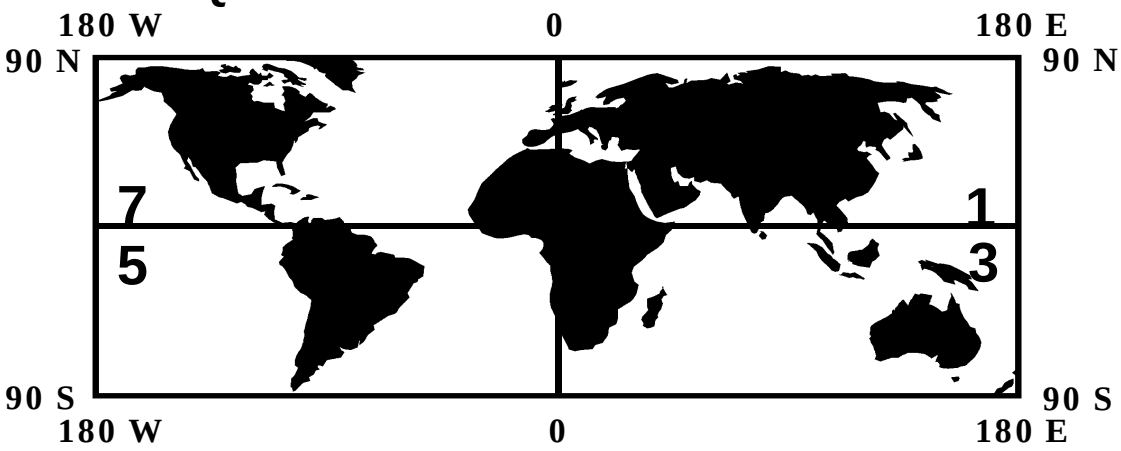
1. **Read the BT trace to the nearest tenth of a degree of temperature (°F or °C) and to the nearest meter or tens of feet of depth.**
2. **When interpreting and encoding the BT trace, always include:**
   a. **Water temperature at sea surface, temperature and depth at the mixed layer depth (if layer exists), and temperature and depth at the deepest point of the trace.**
   b. **Sufficient inflection points to describe the temperature/depth of the trace from the surface to the deepest point of the trace. The total number of inflection points will be determined by the structure of the water mass being measured.**
3. **Do not interpret the trace at convenient depth increments (i.e., 10, 20, 100).**
4. **Ensure all inflection points are measured and recorded accurately.**
5. **If the BT strikes the sea bottom, read the temperature/depth value and report it as per the instructions for the 00000 indicator group (paragraph IIIB9).**

B. RECORDING THE RADIO MESSAGE INFORMATION. (See SAMPLE BATHYTHERMOGRAPH LOG and MESSAGE below.) The procedures for entering the BATHY data are as follows:

1. **Message Prefix - Preprinted JJVV identifies bathythermograph observations. (ALL FOLLOWING SPACES MUST BE FILLED IN FOR RADIO TRANSMISSION IN 5 CHARACTER GROUPS. EXCEPTION: LATITUDE AND LONGITUDE GROUPS ARE 6 CHARACTER GROUPS.)**
2. **DATE (YYMMJ)**
   - **YY** — **Day - Enter the day of month as determined by UTC using numerals 01 through 31.**
   - **MM** — **Month - Enter month of year using numerals 01 through 12.**
   - **J** — **Year - Enter the last digit of year.**
3. **TIME (GGggu)**
   - **GG** — **Hour - Enter the UTC hour of observation.**
   - **gg** — **Minutes - Enter the UTC time in minutes when BT entered water.**
   - **u** — **Units- Solidus (/) indicates temperature is in METRIC units. Use the number "9" when the temperature is in ENGLISH units.**
4. **LATITUDE ($Q_cL_aL_aL_aL_aL_a$)**
   - **Q_c** — **Quadrant of globe - Enter the quadrant of globe from Table 5.**
   - **$L_aL_aL_aL_aL_a$ Latitude -** — **Latitude in tenths, hundredths, and thousandths of a degree.**

Table 5

Quadrants of the Globe



5. **LONGITUDE ($L_oL_oL_oL_oL_oL_o$) - Longitude in tenths, hundredths, and thousandths of a degree.**
6. **INDICATOR GROUP 88888 - Signifies BT instrumentation and temperature/depth information to follow.**
7. **INSTRUMENTATION ($I_xI_xI_xX_rX_r$)**

   $I_xI_xI_x$ **Instrument (probe) type with fall rate equation coefficients. Enter the appropriate code figure using Table 6.**

   X_rX_r **Recorder Type. Enter the appropriate code figure using Table 7.**
8. **TEMPERATURE/DEPTH PAIRS ENTRIES**

   a. METRIC Unit Coding (For use by all reporting units)

   SURFACE READING

   Z_oZ_o **Water surface ("00" is preprinted).**

   $T_oT_oT_o$ **Enter the surface water temperature in °C to a tenth of a degree.**

   SUBSURFACE READINGS TO 99 METERS

   $ZZT_zT_zT_z$ **This group is repeated as many times as necessary, at inflection points, to adequately describe the BT trace.**

   ZZ **Depth Group - Enter in whole meters the depth at which corresponding temperature values are read from the trace. Example: for 5M record 05; for 97M record 97.**

   $T_zT_zT_z$ **Temperature Group - Enter water temperature at depth ZZ in °C to the closet tenth of a degree. All temperature values less than 0°C will be coded at "$5T_zT_z$" (5 indicates that the following T_zT_z value is a negative temperature (for example, -0.2 would be coded as 502).**

SUBSURFACE READINGS 100 METERS AND DEEPER

999NN The 999NN group is a special coding instruction required before recording depths of 100 meters, 200 meters, and each succeeding 100-meter interval to termination. NN is coded as 01 for 100 to 199 meters; 02 for 200 to 299 meters, etc.

ZZ Depth Group - For depths between 100 and 200 meters, 200 and 300 meters, etc., enter the tens and units digits only. Example: for 102M, record 02; for 256M, record 56; for 375M, record 75.

$T_zT_zT_z$ Temperature Group - Enter water temperature at depth ZZ in °C to the closest tenth of a degree.

b. ENGLISH Unit Coding (for use by Navy and Coast Guard units only).

SURFACE READING

Z_oZ_o Water surface ("00" is preprinted).

$T_oT_oT_o$ Enter the surface water temperature in °F to a tenth of a degree.

SUBSURFACE READINGS TO 999 FEET

$ZZT_zT_zT_z$ This group is repeated as many times as necessary, at inflection points, to adequately describe the BT trace.

ZZ Depth Group - Enter the hundreds and tens digits for the closest depth at which corresponding temperature values are read from the trace. Example: for 50feet, record 05; for 540 feet, record 54; for 994 feet, record 99.

$T_zT_zT_z$ Temperature Group - Enter water temperature at depth ZZ in °F to the closet tenth of a degree.

SUBSURFACE READINGS 1000 FEET AND DEEPER

999NN The 999NN group is a special coding instruction required before recording depths of 1000 feet, 2000 feet, and each succeeding 1000-foot interval to termination. NN is coded as 01 for 1000 to 1999 feet; 02 for 2000 to 2999 feet, etc.

ZZ Depth Group - For depths between 1000 and 2000 feet or 2000 and 3000 feet, enter the hundreds and tens digits only. Example: for 1020 feet, record 02; for 1300 feet, record 30; for 1994 feet, record 99.

$T_zT_zT_z$ Temperature Group - Enter water temperature at depth ZZ in °F to the closest tenth of a degree.

Table 6

CODE		INSTRUMENT	EQUATION COEFFICIENTS a AND b ___	
001		SIPPICAN T- 4	6.472	- 2.16
002	▲	SIPPICAN T- 4	6.691	- 2.25
011		SIPPICAN T- 5	6.828	- 1.82
021		SIPPICAN FAST DEEP	6.346	- 1.82
031		SIPPICAN T- 6	6.472	- 2.16
032	▲	SIPPICAN T- 6	6.691	- 2.25
041		SIPPICAN T- 7	6.472	- 2.16
042	▲	SIPPICAN T- 7	6.691	- 2.25
051		SIPPICAN DEEP BLUE	6.472	- 2.16
052	▲	SIPPICAN DEEP BLUE	6.691	- 2.25
061		SIPPICAN T- 10	6.301	- 2.16
071		SIPPICAN T- 11	1.779	- 0.255
201		TSK T- 4	6.472	- 2.16
202		TSK T- 4	6.691	- 2.25
211		TSK T- 6	6.472	- 2.16
212		TSK T- 6	6.691	- 2.25
221		TSK T- 7	6.472	- 2.16
222		TSK T- 7	6.691	- 2.25
401		SPARTAN XBT- 1	6.301	- 2.16
411		SPARTAN XBT- 3	5.861	- 0.0904
421		SPARTAN XBT- 4	6.472	- 2.16
431		SPARTAN XBT- 5	6.828	- 1.82
441		SPARTAN XBT- 5DB	6.828	- 1.82
451		SPARTAN XBT- 6	6.472	- 2.16
461		SPARTAN XBT- 7	6.472	- 2.16
471		SPARTAN XBT- 7DB	6.472	- 2.16
481		SPARTAN XBT- 10	6.301	- 2.16
491		SPARTAN XBT- 20	6.472	- 2.16
501		SPARTAN XBT- 20DB	6.472	- 2.16
510		SPARTAN 536 AXBT	1.524	-0.000
800		MECHANICAL BT		
810		HYDROCAST		
820		THERMISTOR CHAIN		
830		CTD		

▲ = Instrument Codes 002, 032, 042, and 052, are not used with SIPPICAN MK2/SSQ-61 (Table 7 Code 02) or SIPPICAN AN/BQH-7/MK8 (Table 7 Code 04) recorders. Use the Integrated Global Ocean Services System Drop Rate values for these probes.

NOTE: The depth is calculated from coefficients "a" and "b" and the time (t), as follows: $Z = at + 10^{-3} bt^2$, where Z = depth.

Table 7

X_rX_r

CODE	RECORDER
01	SIPPICAN STRIP CHART RECORDER
02	SIPPICAN MK2A/SSQ- 61
03	SIPPICAN MK- 9
04	SIPPICAN AN/BQH- 7 MK8
05	SIPPICAN Mk-12
10	SPARTAN SOC BT/SV PROCESSOR MODEL 100
11	LOCKHEED-SANDERS MODEL OL5OO5
20	ARGOS XBT-ST
21	CLS-ARGOS/PROTECNO XBT-ST MODEL 1
22	CLS-ARGOS/PROTECNO XBT-ST MODEL 2
30	BATHY SYSTEMS SA-810
31	SCRIPS METROBYTE CONTROLLER
32	MURAYAMA DENKI Z-60-16 III
33	MURAYAMA DENKI Z-60-16 II
34	PROTECNO ETSM2
35	NAUTILUS MARINE SERVICE NMS-XBT
40	TSK MK-2A
41	TSK MK-2S
42	TSK MK-30
43	TSK MK30N
99	UNKNOWN

9. **INDICATOR GROUP 00000 - Insert after last $ZZT_zT_zT_z$ group if last group is an ocean bottom reading.**
10. **RADIO CALL - For ships, all messages must terminate with the ship radio call; for aircraft, use the squadron designator or "ACFT".**

C. ADDRESSING MESSAGES FOR RADIO TRANSMISSION

BATHY observations, classified or unclassified, in accordance with ship/aircraft movement, are to be transmitted with PRIORITY precedence to the appropriate Collective Address Designator (CAD) below:

OCEANO EAST: For observations reported in the Northern Hemisphere for all geographic areas from 95W eastward to 100E, and the Southern Hemisphere from 92W eastward to 17E. The addresses of CAD OCEANO EAST can be found in NAVMETOCCOMINST 3140.1 ():

OCEANO WEST: For observations reported in the Northern Hemisphere for all geographic areas from 100E eastward to 95W, and the Southern Hemisphere from 17E eastward to 92W. The addresses of CAD OCEANO WEST can be found in NAVMETOCCOMINST 3140.1 ():

IV. ADDITIONAL NAVY INSTRUCTIONS

A. SHIPS. Navy ships, in addition to filling out the REFERENCE and RADIO MESSAGE INFORMATION sections, will fill in the FOR NAVY SHIP USE section in the upper left corner of the log sheet as follows:

1 - 4	**Enter first two letters of ship type in spaces 1 and 2, and remaining letters as appropriate in the next two spaces.**
5 - 8	**Enter hull number; precede by zeros if less than four digits.**
9	**Enter last digit of current calendar year.**
10 - 11	**Enter two digit number of current month. Example: May is 05.**

B. AIRCRAFT. Navy aircraft, in addition to filling out the REFERENCE and RADIO MESSAGE INFORMATION sections, will fill in the FOR NAVY AIRCRAFT USE section in the upper right corner of the log sheet as follows:

1 - 2	**Enter first two letters of squadron type in spaces 1 and 2. (Exception: VAW squadrons enter "AW".)**
3 - 5	**Enter squadron number; precede by zeros if less than four digits. (Exception: Detachments enter "D" followed by detachment number.)**
6 - 9	**Enter numbers and/or letters assigned to identify, within a squadron, each sortie of each aircraft.**
10	**Enter last digit of current calendar year.**
11 -12	**Enter two digit number of current month. Example: May is 05.**

C. SUBMARINES. Navy submarines will fill out the RADIO MESSAGE INFORMATION section as follows:

In the Surface Depth-Temperature group [with "00" preprinted in depth group (Z_oZ_o)] , enter 999 in temperature group $T_oT_oT_o$ to indicate submarine observations. The temperature profile begins with the next group, i.e. $00T_oT_oT_o$.

Table 8
Temperature Conversion

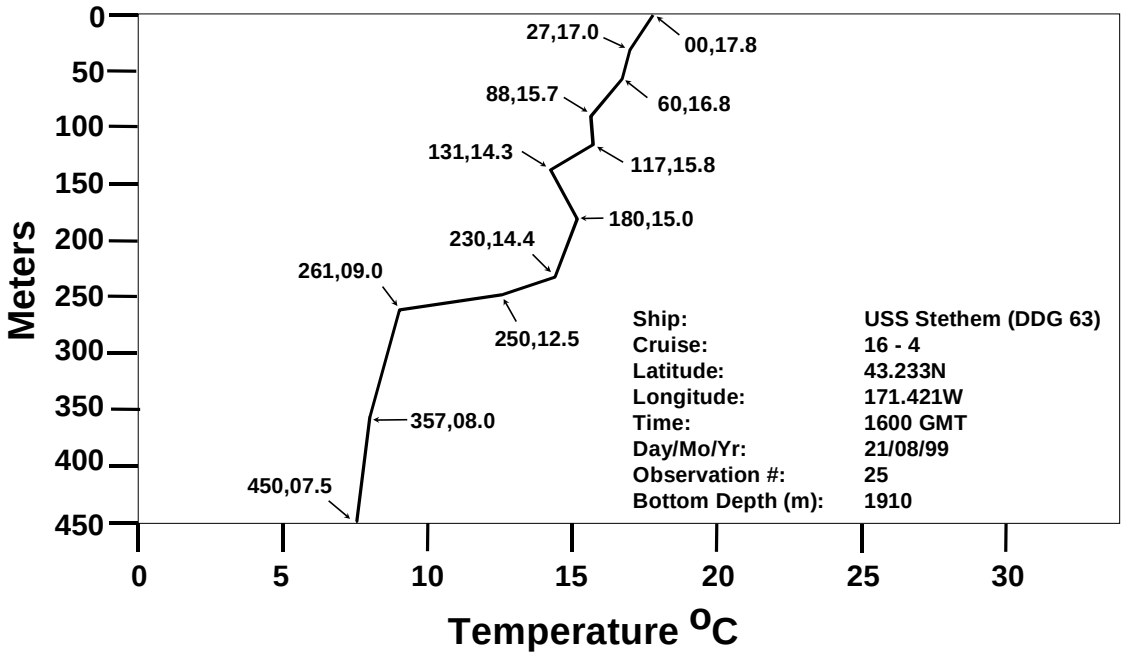
Fahrenheit to Celsius: $^oC = 5/9^oF - 32$

Celsius to Fahrenheit: $^oF = 9/5^oC + 32$

Table 9
Depth Conversion

Feet to Meters:	**1 M = 3.28 Ft.**
Meters to Feet:	**1 Ft. = .305 M**

Sample Shipboard Expendable Baththermograph (SXBT) Trace



English Example

1				2					3					Quad	4						5						6					7				
Message Prefix				Date (UTC)					Time (UTC)						Latitude						Longitude						Indicator Group					Instruments				
				Day		Mon		Yr	Hour		Min				Deg			Dec.			Deg			Dec.								BT Type		Rcdr	
M_i	M_i	M_j	M_j	Y	Y	M	M	J	G	G	g	g	u	Q_c	L_a	L_a	L_a	L_a	L_a	L_o	L_o	L_o	L_o	L_o	L_o						I_X	I_X	I_X	X_r	X_r
J	J	V	V	2	1	0	8	9	1	6	0	0	9	7	4	3	2	3	3	1	7	1	4	2	1	8	8	8	8	8	0	3	1	0	4

Depth		Temp			Depth		Temp			Depth		Temp			Depth		Temp			Depth		Temp			Depth		Temp			Depth		Temp		
Z	Z	T_o	T_o	T_o	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z
0	0	6	4	0	0	9	6	2	6	2	0	6	2	2	2	9	6	0	3	3	8	6	0	4	4	3	5	7	7	5	9	5	9	0

Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z
7	6	5	7	9	8	2	5	4	5	8	6	4	9	2	9	9	9	0	1	1	7	4	6	4	4	8	4	5	5					

Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Radio
																													STET

Sample Message

FM USS STETHAM
TO OCEANO WEST
BT
UNCLAS //N03140//
SUBJ/BATHY REPORT//
RMKS/

Metric Example

JJVV 21089 1600/ 74323 17142 18888 03104
00178 27170 60168 88157 99901 17158 31143
80150 99902 30144 50125 61090 99903 57080
99904 50075 STET//

or

English Example

JJVV 21089 16009 74323 17142 18888 03104
00640 09626 20622 29603 38604 43577 59590
76579 82545 86482 99901 17464 48455 STET//
BT

Bathythermograph Log

Prepared by CNMOC in accordance with specifications established by the WORLD METEOROLOGICAL ORGANIZATION (WMO)

FOR NAVY SHIP USE

Ship Type				Hull Number				Yr	Mon	
1	2	3	4	5	6	7	8	9	10	11

FOR NAVY AIRCRAFT

SQDN Type		SQDN Number			Sortie Number				Yr	Mon	
1	2	3	4	5	6	7	8	9	10	11	12

I. Reference Information

Platform	Type:	Name:	Designator:

Country:	Institution:	Project:

Cruise #:	Station #:	Observation #:	Instrument:

II. Optional Environmental Information

1 Depth to Bottom (Meters)	2 Wind					3 Sea Level Pressure				4 Air Temp				5 Air Temp				6 Sea Temp				7 Wave				8 Swell						9 Solar Radiation	10 Precip		11 Trans
		Dir		Speed						±	Dry Bulb			±	Wet Bulb			°C			Inst	Per		Ht		Dir		Per		Ht					
	i_u	d	d	f	f	P	P	P	P	S_n	T	T	T	S_n	T	T	T	T_w	T_w	T_w		P_w	P_w	H_w	H_w	d_w	d_w	P_w		H_w	H_w	Lang/Min	R	R	Meters

III. Radio Message Information

1 Message Prefix				2 Date (UTC)					3 Time (UTC)					Quad	4 Latitude					5 Longitude						6 Indicator Group					7 Instruments				
				Day		Mon		Yr	Hour		Min				Deg		Dec. Deg			Deg		Dec. Deg									BT Type			Recorder	
M_i	M_i	M_j	M_j	Y	Y	M	M	J	G	G	g	g	u	Q_c	L_a	L_a	L_a	L_a	L_a	L_o	L_o	L_o	L_o	L_o	L_o						I_x	I_x	I_x	X_r	X_r
J	J	V	V																							8	8	8	8	8					

Depth		Temp			Depth		Temp			Depth		Temp			Depth		Temp			Depth		Temp			Depth		Temp			Depth		Temp		
Z	Z	T_o	T_o	T_o	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z
0	0																																	

Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z

Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z

Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z

Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Z	Z	T_z	T_z	T_z	Radio

Remarks: